

# UNCLASSIFIED

FY 2003 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2002

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0308601N  
PROGRAM ELEMENT TITLE: Naval Modeling and Simulation

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 2001 ACTUAL	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R2222 Naval Modeling & Simulation	13,377	7,709	7,783	9,256	10,132	10,658	11,114	CONT.	CONT.
R2810 Enhanced M&S Initiatives		4,857							
Total	13,377	12,566	7,783	9,256	10,132	10,658	11,114	CONT.	CONT.

- A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Funds the efforts of Navy Modeling and Simulation (M&S) Management Office and the Department of the Navy Technical Support Group (TSG). Supports technical and management initiatives directed by Congress, Department of Defense (DoD) and Secretary of the Navy (SECNAV) with the aim of bringing organization and focus to the development and use of Modeling and Simulations (M&S) tools throughout Navy and DoD. It provides a central agency for the formulation and implementation of policy and guidance in M&S; represents Navy interests in Joint/other Agency. Funds efforts to define and coordinate execution of a Navy M&S program to evolve an interoperable and reusable core M&S capability consistent with the M&S technical framework prescribed by DoD. Efforts are organized around four product areas: (1) Engineering Studies and Analysis, to define the feasibility and applicability of proposed standards to Navy and to investigate service unique requirements for standards or guidance; (2) Products and Services, to develop the policy, standards, and common tools and services necessary to guide more efficient development and use of M&S across Navy; this includes development and management of the Navy Modeling and Simulation Information System (NMSIS), Navy counterpart to the DOD M&S Resource Repository, to provide a central M&S information resource to reduce stove-piped development, promote tool reuse and support informed M&S investment decisions; (3) M&S Quality Assurance Program, to establish and manage a disciplined process of model verification, validation and accreditation (VV&A) required by current directives; (4) Simulation Experiments, to test distributive simulation technology in fleet exercises, experiments, and pilot efforts which demonstrate and examine the value and limitations of proposed standards (such as High Level Architecture (HLA) and Simulation Based Acquisition (SBA)) to mission and program requirements.

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(U) Congressional Plus up: Enhanced M&S Initiatives: No specific language is given. Work will be performed in support of Modeling & Simulation technology.

(U) PROGRAM CHANGE FOR TOTAL PE:

	FY 2001	FY 2002	FY 2003
FY 2002 President's Budget	13,976	7,828	
Adjustments from FY 2002 PRESBUDG:			
SBIR Adjustments	-239		
Execution Adjustments	-360		
Undistributed Reductions (FFRDC)		-50	
Congressional Plus up		4,900	
Section 8123 Management Improvement Initiative		-112	
FY 2003 PRESBUDG Submission	13,377	12,566	7,783

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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PROJECT NUMBER & TITLE	FY 2001 ACTUAL	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R2222 Naval Modeling & Simulation	13,377	7,709	7,783	9,256	10,132	10,658	11,114	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Program funds overarching policy, coordination and technical support for Navy Modeling and Simulation (M&S). The program specifically provided critical coordination of Navy M&S efforts, integrated individual programs into a coherent whole, promoted reuse of resources, and aligned Navy efforts with Joint programs. Developed and maintained a comprehensive repository of models, simulations and authoritative data to support broad-based Navy requirements. Promoted reusability through the Quality Assurance process for models, simulations and data enhanced Interoperability by coordinating and reviewing Navy's transition to DoD mandated High Level Architecture for distributed simulations. Participated in fleet exercise experiments, distributive simulations and demonstrations (such as Fleet Battle Experiments-I, Virtual at Sea Training (VAST), and Virtual Missile Range (VMR)).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2001 ACCOMPLISHMENTS:

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- (U) (\$1,863) Engineering Studies and Analysis: Continued to develop and implement the Navy strategy for the transition of Navy M&S to the Office of Secretary of Defense (OSD)-mandated M&S interoperability standard, High Level Architecture (HLA). Led Navy HLA implementation planning, reported Navy compliance to DoD, and participated in the DoD HLA transition working group. Briefed Navy flags, intra and inter service forums on the issues and technical implications of Navy M&S compliance with HLA. Continued to develop attributes for designing modeling standards of communication networks and information systems. This was done in collaboration with the Joint Staff (JS) Networkcentric Warfare System (NETWARS) standards working group. Performed analysis of current operational communications infrastructure and derived a method to extract, process and archive information to support operational analysis capabilities through modeling and simulation. Initiated studies to identify building blocks functions required within Defense Information Infrastructure (DII) Common Operating Environment(COE) based Command, Control Communications, Computer, and Intelligence (C4I) systems to support simulation development. This will provide the capability to link Global Command and Control Systems (GCCS) operational functions with simulations. Continued to develop and implement a roadmap for migrating existing standalone training modeling capability into a more integrated, interoperable core suite of capability tailored to the Navy training requirements. Continued establishment of a Modeling and Simulation degree program at the Naval Postgraduate School, Modeling, Virtual Environments and Simulation (MOVES) curriculum.
- (U) (\$7,776) Products and Services: Developed and provided an operational implementation of the web-based Navy Modeling and Simulation Information System (NMSIS), the Naval component of the DoD M&S resource repository (part of the DoD M&S Framework). Updated and provided user assistance and support on the Naval M&S Catalog. Supported planning and technical coordination of efforts across Navy M&S Functional Areas, other services, OSD, Joint Staff, and other agencies to develop policies and procedures for M&S standardization. Coordinated and chaired Navy's M&S Working Group and Navy Flag M&S Steering Group; participated in the Defense M&S Office's M&S working group and the DoD M&S Executive Council, including separate forums for training, assessments & acquisition; and coordination of technical reviews of joint programs and initiatives Joint Simulation System (JSIMS), Joint Warfare Systems (JWARS), Joint Modeling and Simulation System (JMASS) and NETWARS). Participated in select OSD and industry sponsored symposia. Continued implementation of a Navy M&S Standards Steering Group and a series of Technical Interchange Meetings for the M&S community.

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- (U) (\$730) M&S Quality Assurance Program: Continued to implement and manage the M&S Quality Assurance development of the Verification, Validation, and Accreditation (VV&A) process and guidelines for modeling, simulation, and data. Provided technical review on M&S VV&A plans and reports and provided subject matter expertise and advice on how to meet Navy policy requirements within existing fiscal and programmatic constraints. Develop and implemented an initial version of a web-based VV&A Handbook aimed at supporting program managers across the Navy. Establish and implement a VV&A training curriculum for developers and accreditors. Provide annual VV&A assessment to the Chief of Naval Operations (CNO).
- (U) (\$3,008) Simulation Experiments: Provided Navy share of Services' contribution to maintenance of the simulation protocol needed to use Joint Training Confederation simulations in Joint Task Force Exercises. Ensured simulation of Naval forces and supported Navy participation in Joint exercises; supported Ulchi Focus Lens, Synthetic Theater of War, and United Endeavor. Identified initial suite of existing M&S tools to offer near term relevance and application to the goals of the Maritime Battle Center (MBC) and the ongoing evaluation of systems and technologies in reoccurring Fleet Battle Experiments (FBE). Continued development of a Virtual Missile Range to support Fleet training needs. Continued development of the Maritime Virtual Environmental Data Specification (MARVEDS) to provide standards that represent the natural environment. This type of standard for simulation environments is critical to enabling Simulation Based Acquisition (SBA). Participated in OSD effort to develop a definition, functional description, and implementation plan for simulation-based acquisition. Provided core support in the development of a Probability of Raid Annihilation (PRA) Federation for use in surface ship combat system test and evaluation.

(U) FY 2002 PLAN:

- (U) (\$1,313) Engineering Studies and Analysis: Conduct engineering studies and analysis aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy and at investigating service unique requirements for standards or guidance. Individual study thrusts will focus on developing or evaluating approaches to optimize training, assessments and acquisition functional/mission objectives through more efficient development and use of M&S. Develop methodologies and standards that will result in model and data reusability and interoperability through the formulation of a technical framework. These standards will support the full range of

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architecture and engineering design and analysis requirements across Navy. Provide a M&S degree program through the Naval Postgraduate School, MOVES curriculum.

- (U) (\$2,561) Products and Services: Continue development of common services, tools, and databases. Develop and enhance the NMSIS, through an evolutionary process, integrating standards, standard models, standard data and connectivity to support all Naval assessments, training, acquisition and operational communities. Manage and maintain the NMSIS, as a central M&S information resource to reduce stove-piped development, promote standardization and reuse and support informed M&S investment decision making across Navy. Provide the necessary planning and coordination of M&S efforts across the Navy M&S Functional Areas, other Services, OSD, Joint Staff, and other agencies to develop policies and procedures necessary for M&S standardization within the Navy. Provide annual updates to the Naval M&S Catalog, Master Plan, and Investment Strategy.
- (U) (\$790) M&S Quality Assurance Program: Continue to implement and manage the M&S Quality Assurance development of the VV&A process and guidelines for modeling, simulation, and data. Continue to review both new and legacy M&S VV&A plans and reports. Develop and maintain the Naval M&S verification, validation and accreditation (VV&A) repository. Establish and implement a VV&A training curriculum for developers and accreditors. Provide annual verification validation and Accreditation VV&A assessment to the CNO.
- (U) (\$3,045) Simulation Experiments: Support Fleet exercises and experiments through the application of distributed simulation to a wide variety of operational, research and development, training, test and evaluation exercises. Develop and integrate appropriate models and simulations into the FBE. Develop a series of simulation projects to test and evolve the standards for models, interfaces, data, and tools necessary to enable the seamless access and use of operationally relevant M&S to support the range of Navy training, warfare assessments and acquisition requirements.

(U) FY 2003 PLAN:

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PROGRAM ELEMENT TITLE: Naval Modeling and Simulation

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- (U) (\$1,313) Engineering Studies and Analysis: Conduct engineering studies and analysis aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy and at investigating service unique requirements for standards or guidance. Individual study thrusts will focus on developing or evaluating approaches to optimize training, assessments and acquisition functional/mission objectives through more efficient development and use of M&S. Develop methodologies and standards that will result in model and data reusability and interoperability through the formulation of a technical framework. These standards will support the full range of architecture and engineering design and analysis requirements across Navy. Provide a M&S degree program through the Naval Postgraduate School, MOVES curriculum.
- (U) (\$2,666) Products and Services: Continue development of common services, tools, and databases. Develop and enhance the NMSIS, through an evolutionary process, integrating standards, standard models, standard data and connectivity to support all Naval assessments, training, acquisition and operational communities. Manage and maintain the NMSIS, as a central M&S information resource to reduce stove-piped development, promote standardization and reuse and support informed M&S investment decision making across Navy. Provide the necessary planning and coordination of M&S efforts across the Navy M&S Functional Areas, other Services, OSD, Joint Staff, and other agencies to develop policies and procedures necessary for M&S standardization within the Navy. Provide annual updates to the Naval M&S Catalog, Master Plan, and Investment Strategy.
- (U) (\$790) M&S Quality Assurance Program: Continue to implement and manage the M&S Quality Assurance development of the VV&A process and guidelines for modeling, simulation, and data. Continue to review both new and legacy M&S VV&A plans and reports. Develop and maintain the Naval M&S VV&A repository. Establish and implement a VV&A training curriculum for developers and accreditors. Provide annual VV&A assessment to the CNO.
- (U) (\$3,014) Simulation Experiments: Support Fleet exercises and experiments through the application of distributed simulation to a wide variety of operational, research and development, training, test and evaluation exercises. Develop and integrate appropriate models and simulations into the FBE. Develop a series of simulation projects to test and evolve the standards for models, interfaces, data, and tools necessary to enable the seamless access and use of operationally relevant M&S to support the range of Navy training, warfare assessments and acquisition requirements.

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B. (U) PROGRAM CHANGE SUMMARY: See Total Program Change Summary for PE.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

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*Exhibit R-3 Cost Analysis (page 1)									DATE: February 2002			
APPROPRIATION/BUDGET ACTIVITY: 7			PROGRAM ELEMENT: 0308601N						PROJECT NAME AND NUMBER: Modeling & Simulation R2222			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY-01 Cost	FY-01 Award Date	FY-02 Cost	FY-02 Award Date	FY-03 Cost	FY-03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
			.									
Navy M&S Info Sys Development	Various	Various	1721	3888	VAR	1281	TBD	1333	TBD	Cont.	Cont.	Cont.
Quality Assurance	Various	Various	1235	730	VAR	790	TBD	790	TBD	Cont.	Cont.	Cont.
Subtotal Product Development			2956	4618		2071		2123		Cont.	Cont.	Cont.
M&S Services	Various	Various	1873	3888	TBD	1280	TBD	1333	TBD	Cont.	Cont.	Cont.
Subtotal Support			1873	3888		1280		1333	TBD	Cont.	Cont.	Cont.

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Exhibit R-3 Cost Analysis (page 2)									Date: February 2002			
APPROPRIATION/BUDGET ACTIVITY: 7			PROGRAM ELEMENT: 0308601N						PROJECT NAME AND NUMBER: Modeling & Simulation, R2222			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY01 Cost	FY-01 Award Date	FY-02 Cost	FY-02 Award Date	FY-03 Cost	FY-03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Simulation Experiments	Various	Various	2683	3008	TBD	3045	TBD	3014	TBD	Cont.	Cont.	Cont.
<b>Subtotal T&amp;E</b>			2683	3008		3045		3014		Cont.	Cont.	Cont.
Engineering Studies/Analyses	Various	Various	3408	1863	TBD	1313	TBD	1313	TBD	Cont.	Cont.	Cont.
Program Management										Cont.	Cont.	Cont.
<b>Subtotal Management</b>			3408	1863		1313		1313		Cont.	Cont.	Cont.
<b>Total Cost</b>			10920	13377		7709		7783		Cont.	Cont.	Cont.

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